

REMARKS

35 U.S.C. § 103(a): Farkas

Claims 1-5, 7 and 14 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Farkas et al. patent in view of the Farkas article. Applicants respectfully submit, however, that this conclusion of obviousness is improperly drawn in hindsight only after reading Applicants' claims. The Office Action does not point out any teaching or suggestion from the Farkas et al. patent or the Farkas article as to why one of ordinary skill in the art would have been motivated to combine the teachings in the manner suggested in the Office Action.

In fact, Applicants respectfully submit that the Farkas et al. patent teaches away from the use of cerium ions, as claimed in the present application. The Farkas et al. patent states in column 2, lines 37-44:

Many ammonium salt species do not contain metallic species so that the ammonium salts will not significantly stain/coat CMP equipment. In addition, due to the lack of metallic species, a top surface of the silicon wafer will not be contaminated by the slurry containing ammonium salt(s). Furthermore, the ammonium salt species taught herein do not contain potassium, or similar mobile ions, which can diffuse readily through dielectric materials.

In contrast, the present application claims cerium ions (similar mobile ions).

The Office Action further states on page 4, lines 18-20, that the Farkas article teaches the pH range claimed in the present application:

Table 1, which experimented with a pH at 4 (pg 27), and table 2 show effect of these parameters through experimentations. These parameters overlap claimed parameters.

Applicants respectfully submit, however, that Table 2 shows a cerium containing slurry with a pH less than 1. Therefore, in combination, the Tables 1 and 2 teach a pH range equal to 4 and less than 1, which does not overlap the claimed pH range of above 1.5 and below 3.0.

Therefore, Applicants submit that the Farkas et al. patent and the Farkas article, separately or in combination, fail to teach the present invention, as claimed in independent claim 1. Accordingly,

Applicants submit that independent claim 1 is patentable over the Farkas et al. patent and the Farkas article. Because claims 2-5, 7 and 14 depend from claim 1, directly or indirectly, Applicants submit that these claims are also patentable over the Farkas et al. patent and the Farkas article. Accordingly, Applicants respectfully request removal of this rejection.

35 U.S.C. § 103(a): Farkas in view of Brusic

Claims 6, 8 and 9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Farkas et al. patent and the Farkas article in view of the Brusic et al. article. Applicants submit that the Brusic et al. article does not affect the patentability of claim 1. Because claims 6, 8 and 9 each depend, directly or indirectly from claim 1, Applicants submit that these claims are therefore patentable over the Farkas et al. patent, the Farkas article and the Brusic et al. article.

Applicants further submit, however, that the Brusic et al. article, on page 181, lines 16-19, teaches away from using glycine, due to an uncontrollably high etch rate:

With higher amounts of glycine (>.5%), the principal reaction is the formation of a water soluble Cu-glycine complex with peroxide reduction proceeding on film-free Cu surface with a very high Cu dissolution rates and, consequently, very high, uncontrollable removal rates observed during the polishing.

35 U.S.C. § 103(a): Farkas in view of Grumbine

Claims 10-13 and 26-29 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Farkas et al. patent and the Farkas article in view of the Grumbine et al. patent. Applicants submit that the Grumbine et al. patent does not affect the patentability of claim 1. Because claims 10-13 each depend, directly or indirectly from claim 1, Applicants submit that these claims are therefore patentable over the Farkas et al. patent, the Farkas article and the Grumbine et al. patent.

Applicants further submit that the Grumbine et al. patent does not provide any motivation to combine the references, as suggested in the Office Action. Table 1 of Grumbine lists results of Tungsten etching using slurries with different inhibitors. The standard slurry with

no inhibitor etches Tungsten at a rate of 41 Ang/min (column 9, lines 18-20), while a slurry with Benzotriazole (BTA) as an inhibitor etches Tungsten at a rate of 40 Ang/min. A slurry with the preferred inhibitor, Pyridazine, etches Tungsten at a rate of 31 Ang/min. Applicants respectfully submit, that the inhibitive effects of Tungsten (40 Ang/min) over the standard slurry (41 Ang/min) are insignificant. Further, the Grumbine et al. only teaches the inhibitive effects on Tungsten etching, while the claimed slurry is for polishing copper. Therefore, Applicants submit that one of ordinary skill in the art would not have been motivated to combine the cited references, as suggested in the Office Action. Applicants respectfully submit that claims 26-29 are patentable over the cited references. Accordingly, Applicants request removal of this rejection.



CONCLUSION

Applicants respectfully submit the present application is in condition for allowance, for which early action is earnestly solicited.

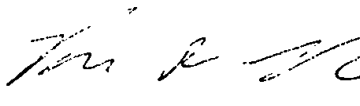
The Examiner is invited to telephone the undersigned to help expedite any further prosecution of the present application.

The Director of the U.S. Patent and Trademark Office is hereby authorized to credit any overpayment or to charge any fees or fee deficiencies under 37 C.F.R. § 1.16 and § 1.17 in connection with this communication to our Deposit Account No. 02-2666.

Respectfully submitted,

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